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EXAMINER	
VIDA, MELANIE M	
ART UNIT	**PAPER NUMBER**
2626	

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b

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)
	09/487,586	MESTHA ET AL.
	Examiner	**Art Unit**
	Melanie M Vida	2626

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *18 April 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-28* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-28* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *30 September 2003* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☒ Interview Summary (PTO-413) Paper No(s)/Mail Date. 9 .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

1. This action is responsive to an amendment filed 4/18/04. Claims 1-28 are pending. Applicants have amended claim 1-2.

Response to Arguments

2. Applicant's argument with respect to the independent **claims 1, 8, and 9** have been considered, but are moot in view of the new ground(s) of rejection. It is agreed that Mestha does not teach measuring reflectance data. However, a new rejection in view of Wang et al. US-PAT-NO: 5,903,712, is applied below.

Drawings

3. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the "certain critical pixels of the image" as recited in **claims 11 and 20** must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

Corrected drawing sheets are required in reply to the Office action to avoid abandonment of the application.

Any amended replacement-drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where

necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the examiner does not accept the changes, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 112

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claim 11 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. It is unclear to the Examiner, after thoroughly reviewing the Application, (i.e. specification and drawings) what the Applicants define as "certain critical pixels of the image" as recited in claim 11, (lines 2-3).

Claim Rejections - 35 USC § 102

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who

> has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) and the Intellectual Property and High Technology Technical Amendments Act of 2002 do not apply when the reference is a U.S. patent resulting directly or indirectly from an international application filed before November 29, 2000. Therefore, the prior art date of the reference is determined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

6. **Claims 1-11, 13-14, 16, 19, 20, 22-23, 25** are rejected under 35 U.S.C. 102(e) as being anticipated by Wang et al. US-PAT-NO: 5,903,712 (hereinafter, Wang).

Regarding, **claim 1,** Wang, as shown in figure 1, depicts a general control system (10) for a printing press (11), which reads on "a device and illumination independent color reproduction system", (col. 4, lines 43-45; col. 5, lines 52-54).

Wang teaches a four-color printing press (11), which reads on "a color marking device" including a camera or sensors (22 and 34) and filter (50) that senses the reflection of the inks, which reads on "including a color sensor", (col. 5, lines 54-60). The camera or sensor (34) and filter (50) senses the light energy reflected from the printed material, which reads on "that measures a reflectance spectra", (col. 5, lines 10-19, lines 20-24).

Wang teaches that the control system (10) transmits the sensed data to store it in computer (30) memory to be processed by the computer (30), which reads on "a color controller including a memory and a controller", (col. 5, lines 1-9; col. 5, lines 15-20; col. 5, lines 47-51). Wang teaches a forward transfer function as shown in figures 9 and 10, which reads on,

including a feed-forward look-up table", (col. 5, lines 64 through col. 6, lines 4; col. 7, lines 53-65).

Wang teaches the control system (10) may comprise processes (23), which reads on "a first processing circuit" that convert the reflected light energy from reading a *reference copy*, which reads on "that converts the reference color spectra" into F_1, F_2, F_3, F_4 such as the colors red, green, and blue in the visible region and the near infrared energy in the infrared region, which reads "into a reference parameter", (Emphasis added; col. 6, lines 5-11 and lines 39-43; col. 8, lines 59-65). Wang teaches all possible values that are output from the sensor device (21) may be used to form a vector space, which reads on "a parameter vector", (col. 7, lines 13-14 and lines 25-27).

Wang teaches that the control system (10) uses a "Ink Separation Process" (23), which reads on "a second processing circuit" that convert the reflected light energy from measuring a *production copy*, which reads on "that converts the measured color spectra" into F_1, F_2, F_3, F_4 such as the colors red, green, and blue in the visible region and the near infrared energy in the infrared region, which reads "into a measured parameter", (Emphasis added; col. 6, lines 5-11 and lines 39-43; col. 8, lines 59-65). Wang teaches all possible values that are output from the sensor device (21) may be used to form a vector space, which reads on "a parameter vector", (col. 7, lines 13-14 and lines 25-27).

Regarding, **claim 2,** Wang depicts a reverse transfer function, as shown in figure 10, which reads on "including an image parameter mapping look-up table" that translates a four-dimensional sensor space vector, which reads on "that translates color image parameters" into a

four-dimensional vector in ink space, which reads on "to a device dependent color space", (see figure 10).

Regarding, **claim 3,** Wang depicts a forward transfer function, which reads on "including an image parameter mapping look-up table", that translates a four-dimensional vector in ink space, which reads on "that translates the color image parameters" into a four-dimensional vector in sensor space, which reads on "to a device independent color space", (see figure 10).

Regarding, **claims 4-5,** Wang teaches that the press (11) comprises a sensor (21) and a device (25) for controlling ink flow, which reads on "the color sensor is mounted in an output path (i.e. tray) of the color marking device", (col. 4, lines 46-49).

Regarding, **claim 6,** Wang, as shown in figure 2, teaches that a sheet of paper (14) with image or indicia (16) is illuminated and a color sensor (22) or video camera detect attributes of the inks from the sheet (14) in the visible region of the electromagnetic spectrum such as red, green, and blue, or cyan, magenta, yellow, and black for sending the sensed information over separate lines, to suitable digital computer (30) or CPU having a display (32), which reads on "further comprising at least one color image data source connectable to the first processing circuit", (col. 4, lines 60 through col. 5, lines 9).

Regarding, **claim 7,** Wang, as shown in figure 2, teaches that a sheet of paper (14) with image or indicia (16) is illuminated and a color sensor (22) or video camera detect attributes of the inks from the sheet (14) in the visible region of the electromagnetic spectrum such as red, green, and blue, or cyan, magenta, yellow, and black for sending the sensed information over separate lines, to suitable digital computer (30) or CPU having a display (32), which reads on "when at least one color image data source is one of a locally or remotely located computer, a

personal digital assistant, a scanner, a digital camera, or a facsimile machine,", (col. 4, lines 60 through col. 5, lines 9).

Regarding, **claim 8,** Wang, as shown in figure 1, depicts a general control system (10) for a four-color printing press (11) in order to adjust the color of printing copies on the press so that it looks substantially like the reference, which reads on "an apparatus for improving color reproduction", (col. 4, lines 43-45; col. 5, lines 52-54).

Wang teaches the control system (10) may comprise processes (23), which reads on "a first processing circuit" that convert the reflected light energy from reading a *reference copy*, which reads on "that converts the reference color spectra" into F_1, F_2, F_3, F_4 such as the colors red, green, and blue in the visible region and the near infrared energy in the infrared region, which reads "into a reference parameter", (Emphasis added; col. 6, lines 5-11 and lines 39-43; col. 8, lines 59-65). Wang teaches all possible values that are output from the sensor device (21) may be used to form a vector space, which reads on "a parameter vector", (col. 7, lines 13-14 and lines 25-27).

Wang teaches that the control system (10), which reads on "a color controller", comprises an Ink Separation Process (23) used to convert red, green, blue, and IR images, which reads on "that converts the reference parameter vector", into a four separated cyan, magenta, yellow, and black images, which reads on "to a processed reference parameter vector", (col. 5, lines 64 through col. 6, lines 4).

Wang teaches a four-color printing press (11), which reads on "a color marking device", prints ink images of the reference copy, which reads on "that prints an image based on the processed parameter vector", (col. 5, lines 54-58; col. 6, lines 5-13 and lines 49-55).

The camera or sensor (34) and filter (50), which reads on “a color sensor”, senses the light energy reflected from the printed material, which reads on “that measures a reflectance spectra”, based on the current printed copy that has been formed into digital information and placed in memory (col. 5, lines 55-63).

Wang teaches that the control system (10) uses a “Ink Separation Process” (23), which reads on “a second processing circuit” that convert the reflected light energy from measuring a *production copy*, which reads on “that converts the measured color spectra” into F_1, F_2, F_3, F_4 such as the colors red, green, and blue in the visible region and the near infrared energy in the infrared region, which reads “into a measured parameter”, (Emphasis added; col. 6, lines 5-11 and lines 39-43; col. 8, lines 59-65). Wang teaches all possible values that are output from the sensor device (21) may be used to form a vector space, which reads on “a parameter vector”, (col. 7, lines 13-14 and lines 25-27).

As shown in figure 3, the control system (10), which reads on “color controller” compares the ink images of the reference copy, which reads on “that compares the reference parameter vector” with the ink images of the production copy, which reads on “with the measured parameter vector” and produces a variation of ink distribution for each of the cyan, magenta, yellow, and black inks to prove whether or not an ink adjustment is needed or not to the press such that a closer match of the further copies to the reference copy, which reads on “and produces, if the color controller determines that the reference parameter vector is not within an acceptable range of equivalents to the corresponding measured parameter vector”, (col. 6, lines 12-25). Wang inherently, teaches “a compensated description of errors and the parameter vectors after processing the errors and the parameter vectors”, as evidenced by the step of detecting the

variation (i.e. error) between the ink distribution of cyan, magenta, yellow, and black inks among the production copy and the reference copy by the computer (30) and further evidenced in that an ink adjustment is applied to the press to obtain further copies which closely match the reference copy, (col. 6, lines 5-25).

Regarding, **claim 9,** Wang, as shown in figure 1, teaches a method for controlling the ink feed rate for the press (11), which reads on "a method for improving color reproduction", (col. 4, lines 47-49). A CCD with built-in filters receives reflected light energy from a ***reference copy*** i.e. red, green, blue, and near infrared energy, which reads on "receiving a reference reflectance spectra", (Emphasis added; col. 6, lines 5-7; col. 8, lines 59-67). An ink separation process (23) converts the reflected light energy, which reads on "converting the reference reflectance spectra" from a reference copy into cyan, magenta, yellow, and black images, the amount of corresponding ink presented on the reference copy, which reads on "to a corresponding reference parameter vector;" (col. 6, lines 5-11). The image system prints the ***reference copy***, (i.e. a proof) with the corresponding ink amounts, which reads on "printing an image based on the converted reference parameter vector", (Emphasis added; col. 6, lines 29-32). As shown in figure 2, a sheet (14) may contain printed image or indicia (16) which is obtained from a current press run of the press (11), termed a production or current copy, and a sheet (38) containing printed image or indicia (40) termed a reference copy, from a previous reference press run may be placed beneath the cameras (22) and (34) in order to sense the reflected energy from the sheet (38) and send the sensed information to the memory of the computer (30) for storage and processing in the computer (30), which reads on "measuring reflectance spectra of the image printed based on the converted parameter vector", (col. 5, lines 32-42). Wang teaches of "Ink Separation Process"

(23) converts the red, green, blue, and IR images captured from a *live copy* (i.e. production copy) by a four channel sensor (21), which reads on "converting the measured reflectance spectra" and converts it into separated cyan, magenta, yellow, and black ink amounts, which reads on "to a corresponding measured parameter vector", (Emphasis Added: col. 5, lines 64 through col. 6, lines 11). The differences (i.e. error) between the production copy and the reference copy of ink distribution are determined for each of the cyan, magenta, yellow, and black inks (i.e. vectors), which reads on "comparing the reference parameter vector to the measured parameter vector to determine an error vector", (col. 6, lines 5-11). The determined differences in ink distribution (i.e. error vector) between the reference copy and the production copy for each of the cyan, magenta, yellow, and black inks (i.e. parameter vectors) is processed by the computer (30) to control the keys/devices of the press (11) in an ink control process, and provide an indication of an ink adjustment to the press to obtain further copies which have a closer match (i.e. spectrally matched color output) to the reference copy, which reads on "processing the error vector and the parameter vectors to produce a spectrally matched color output", (col. 6, lines 15-21).

Regarding, **claim 10,** Wang teaches the Ink Separation Process (23) may utilize look up tables, which reads on "converting the reference reflectance spectra in a look-up table", (col. 6, lines 1-4).

Regarding, **claims 11 and 20,** as best understood from the claim language, Wang inherently teaches, "converting the measured/reference spectra includes measuring a reflectance spectra of certain critical pixels of the image", as evidenced in that color patches of a control target, as shown in figure 13, are used to capture the reflection values and paired with their

corresponding CMYK dot size to form a data list, (col. 5, lines 64 through col. 6, lines 11; col. 11, lines 4-15).

Regarding, **claim 13,** Wang teaches of converting a CCD-measured, reference copy from light energy (i.e. reflectivity spectra) into the visible wavelengths RGB, and to the non-visible wavelength, infrared, which reads on "converting the reference reflectance spectra", (col. 6, lines 5-10; col. 8, lines 59-67). Wang further teaches, in the background of the invention, the inverse (i.e. reverse) of the Neugebauer equations (i.e. light reflectance as a function of the ink coverage values), that can be solved using complicated non-iterative process to solve multi-variable, non-linear simultaneous equations, which reads on "includes converting the reference reflectance spectra through a non-linear transformation" (col. 2, lines 41-55).

Regarding, **claim 14,** Wang teaches utilizing any suitable means such as look-up tables, mathematic formulas to perform the data conversion task such as converting the reference copy in the red, green, blue, and IR wavelengths captured by the sensor (21), which reads on "converting the reference reflectance spectra includes converting the reference reflectance spectra" to the corresponding ink amounts such as look-up tables, which reads on "using predetermined algorithms", (col. 5, lines 64 through col. 6, lines 4; col. 8, lines 59-63).

Regarding, **claim 16,** Wang teaches that the reference reflectance spectra expressed as light energy, which reads on "converting the reference reflectance spectra" is converted by the CCD sensor (21) into a four dimensional sensor space that includes the visible wavelength's for R, G, B and an infrared wavelength, IR, which reads on "using predetermined algorithms

includes using more than three parameters in the parameter vector per spectra", (col. 8, lines 60-67; col. 8, lines 59-67).

Regarding, **claim 19,** Wang teaches that the information sensed from sheets (14) and sheets (34) are stored in memory, which reads on "converting the measured reflectance spectra includes storing the measured reflectance spectra in a look-up-table", (col. 5, lines 48-51; col. 5, lines 64 through col. 6, lines 11).

Regarding, **claim 22,** Wang teaches of converting a CCD-measured, production copy from light energy (i.e. reflectivity spectra) into the visible wavelengths RGB, and to the non-visible wavelength, infra-red, which reads on "converting the measured reflectance spectra", (col. 5, lines 64 through col. 6, lines 4; col. 8, lines 59-67). Wang further teaches, in the background of the invention, the inverse (i.e. reverse) of the Neugebauer equations (i.e. light reflectance as a function of the ink coverage values), that can be solved using complicated non-iterative process to solve multi-variable, non-linear simultaneous equations, which reads on "includes converting the measured reflectance spectra through a non-linear transformation" (col. 2, lines 41-55).

Regarding, **claim 23,** Wang teaches utilizing any suitable means such as look-up tables, mathematic formulas to perform the data conversion task such as converting a production copy in the red, green, blue, and IR wavelengths captured by the sensor (21), which reads on "converting the measured reflectance spectra includes converting the measured reflectance spectra" to the corresponding ink amounts such as look-up tables, which reads on "using predetermined algorithms", (col. 5, lines 64 through col. 6, lines 4).

Regarding, **claim 25,** Wang teaches that the production copy has a reflectance spectra expressed as light energy, which reads on "converting the measured reflectance spectra" is converted by the CCD sensor (21) into a four dimensional sensor space that includes the visible wavelength's for R, G, B and an infrared wavelength, IR, which reads on "using predetermined algorithms includes using more than three parameters in the parameter vector per spectra", (col. 5, lines 63 through col. 6, lines 4; col. 8, lines 59-67).

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

8. **Claim 12, 15, 21, 24, 27** are rejected under 35 U.S.C. 103(a) as being unpatentable over Wang et al. US-PAT-NO: 5,903,712, (hereinafter, Wang) as applied to claim 1 above, and further in view of Tsuji et al. US-PAT-NO: 5,502,799, (hereinafter, Tsuji).

Regarding, **claim 12,** Wang teaches the method of claim 9 and converting the reference copy through lookup tables or any other suitable means such as mathematic formulas, which reads on "converting the reference reflectance spectra", (col. 5, lines 64 through col. 6, lines 4).

Wang does not expressly disclose, "converting the reference reflectance spectra through a <u>linear transformation</u>" (emphasis added; col. 5, lines 64 through col. 6, lines 4).

However, Tsuji teaches converting the spectral reflectance factor, spectral distribution of the light source, and tristimulus values of a spectrum, which reads on "converting the reference reflectance spectra includes converting the reference reflectance spectra" to determine tristimulus

values X, Y, Z, in accordance with formulae 2, or formulae 22, 23, and 24, which reads on, "through a linear transformation", (col. 1, lines 40-65; col. 30, lines 18-30).

At the time the invention was made, it would have been obvious to one of ordinary skill in the art to modify Wang's method with Tsuji's linear transformation.

One of ordinary skill in the art would have been motivated to provide a linear transformation in order to increase processing speed.

Regarding, **claim 15,** Wang teaches the method of claim 14, and converting the reference copy through lookup tables or any other suitable means such as mathematic formulas, which reads on "converting the reference reflectance spectra", (col. 5, lines 64 through col. 6, lines 11).

Wang does not expressly disclose, "converting the reference reflectance spectra using predetermined algorithms includes using only three parameters in the parameter vector per spectra from one of the standard CIE, xyz, or L*a*b* color spaces", (emphasis added).

However, Tsuji, in the background of the invention, teaches that the spectral reflectance factor of the object surface and the tristimulus values can be transformed through a linear combination transform as shown in formula 2 to obtain (XYZ), which reads on "converting the reference reflectance spectra using predetermined algorithms includes using only three parameters in the parameter vector per spectra from one of the standard CIE, xyz, or L*a*b* color spaces", (please, read the background of the invention).

At the time the invention was made, it would have been obvious to one of ordinary skill in the art to modify Wang's method with Tsuji's reflectance spectra conversion using

predetermined algorithms having only three parameters in the parameter vector per spectra from one of the standard CIE, xyz, or L*a*b* color spaces.

One of ordinary skill in the art would have been motivated to have only three parameters in the parameter vector per spectra from one of the standard CIE, xyz, L*a*b* color spaces because the mathematical relationship is well-known in the art.

Regarding, **claim 21** Wang teaches the method of claim 9, and converting the production copy through lookup tables or any other suitable means such as mathematic formulas, which reads on "converting the reference reflectance spectra", (col. 5, lines 64 through col. 6, lines 4).

Wang does not expressly disclose, "converting the measured reflectance spectra through a <u>linear transformation</u>", (emphasis added).

However, Tsuji, in the background of the invention, teaches that the spectral reflectance of the object surface and the tristimulus values can be transformed through a linear combination transform as shown in equation 2 to obtain CIE XYZ, which reads on "converting the measured reference reflectance spectra includes converting the measured reflectance spectra through a linear transformation", (please, read the background of Tsuji's invention).

At the time the invention was made, it would have been obvious to one of ordinary skill in the art to modify Wang's method with Tsuji's reflectance spectra conversion using predetermined algorithms having only three parameters in the parameter vector per spectra from one of the standard CIE, xyz, or L*a*b* color spaces.

One of ordinary skill in the art would have been motivated to convert in the parameter vector per spectra to the standard CIE, XYZ, or L*a*b* color spaces because the mathematical relationship is well-known in the art.

Regarding, **claim 24,** Wang teaches the method of claim 23, and converting the production copy through lookup tables or any other suitable means such as mathematic formulas, which reads on "converting the measured reflectance spectra", (col. 5, lines 64 through col. 6, lines 4).

Wang does not expressly disclose, "converting the measured reflectance spectra using predetermined algorithms includes using only three parameters in the parameter vector per spectra from one of the standard CIE, xyz, or L*a*b* color spaces", (emphasis added).

However, Tsuji, in the background of the invention, teaches that the spectral reflectance factor of the object surface and the tristimulus values can be transformed through a linear combination transform as shown in formula 2 to obtain (XYZ), which reads on "converting the measured reflectance spectra using predetermined algorithms includes using only three parameters in the parameter vector per spectra from one of the standard CIE, xyz, or L*a*b* color spaces", (please, read the background of the invention).

At the time the invention was made, it would have been obvious to one of ordinary skill in the art to modify Wang's method with Tsuji's reflectance spectra conversion using predetermined algorithms having only three parameters in the parameter vector per spectra from one of the standard CIE, xyz, or L*a*b* color spaces.

One of ordinary skill in the art would have been motivated to have only three parameters in the parameter vector per spectra from one of the standard CIE, xyz, L*a*b* color spaces because the mathematical relationship is well-known in the art.

Regarding, **claim 27,** Wang teaches the method of claim 26, and converting the production copy through lookup tables or any other suitable means such as mathematic formulas,

which reads on "converting the measured reflectance spectra", (col. 5, lines 64 through col. 6, lines 4).

Wang does not expressly disclose, "converting the measured reflectance spectra using predetermined algorithms includes using only three parameters in the parameter vector per spectra from one of the standard CIE, xyz, or L*a*b* color spaces", (emphasis added).

However, Tsuji, in the background of the invention, teaches that the spectral reflectance factor of the object surface and the tristimulus values can be transformed through a linear combination transform as shown in formula 2 to obtain (XYZ), which reads on "converting the measured reflectance spectra using predetermined algorithms includes using only three parameters in the parameter vector per spectra from one of the standard CIE, xyz, or L*a*b* color spaces", (please, read the background of the invention).

At the time the invention was made, it would have been obvious to one of ordinary skill in the art to modify Wang's method with Tsuji's reflectance spectra conversion using predetermined algorithms having only three parameters in the parameter vector per spectra from one of the standard CIE, xyz, or L*a*b* color spaces.

One of ordinary skill in the art would have been motivated to have only three parameters in the parameter vector per spectra from one of the standard CIE, xyz, L*a*b* color spaces because the mathematical relationship is well-known in the art.

9. **Claim 17-18, 26** are rejected under 35 U.S.C. 103(a) as being unpatentable over Wang et al. US-PAT-NO: 5,903,712, (hereinafter, Wang) as applied to claim 1 above, and further in view of Estrada, US-PAT-NO: 6,646,763 B1, (hereinafter, Estrada).

Regarding, **claim 17**, Wang teaches the method of claim 14, and a CCD sensor to measure the light energy reflected from a reference copy and convert it to visible and non-visible wavelengths such as RGB, IR, which reads on "converting the reference reflectance spectra", (col. 6, lines 5-11; col. 8, lines 59-67).

Wang does not expressly disclose, "converting the reference reflectance spectra using predetermined algorithms includes computing standard X, Y, Z, tristimulus values".

However, Estrada teaches a color matching engine converts the colorant's mixture reflectivity data coordinates to XYZ space using well-known CIE integrals, which reads on "converting the reference reflectance spectra using predetermined algorithms includes computing standard X, Y, Z, tristimulus values".

At the time the invention was made, it would have been obvious to one of ordinary skill in the art to modify Wang's method with Estrada's color matching engine.

One of ordinary skill in the art would have been motivated to convert reflectivity data into XYZ space because the CIE integrals are well known, given the express suggestion of Estrada, (col. 7, lines 59-67 through col. 8, lines 1-7).

Regarding, **claim 18,** Estrada teaches that subsequent to the transform of the colorant mixture's reflectivity data to XYZ space, Estrada further applies a well-known linear transform to convert from XYZ color space to Lab color space, as shown, which reads on "converting the reference reflectance spectra using predetermined algorithms includes computing L*a*b* color values", (col. 8, lines 8-35).

Regarding, **claim 26**, Wang teaches the method of claim 23, and a CCD sensor to measure the light energy reflected from a production copy and convert it to visible and non-

visible wavelengths such as RGB, IR, which reads on "converting the measured reflectance spectra", (col. 5, lines 64 through col. 6, lines 4; col. 8, lines 59-67).

Wang does not expressly disclose, "converting the measured reflectance spectra using predetermined algorithms includes computing standard X, Y, Z, tristimulus values".

However, Estrada teaches a color matching engine converts the colorant's mixture reflectivity data coordinates to XYZ space using well-known CIE integrals, which reads on "converting the reference reflectance spectra using predetermined algorithms includes computing standard X, Y, Z, tristimulus values".

At the time the invention was made, it would have been obvious to one of ordinary skill in the art to modify Wang's method with Estrada's color matching engine.

One of ordinary skill in the art would have been motivated to convert reflectivity data into XYZ space because the CIE integrals are well known, given the express suggestion of Estrada, (col. 7, lines 59-67 through col. 8, lines 1-7).

10. **Claim 28** is rejected under 35 U.S.C. 103(a) as being unpatentable over Wang et al. US-PAT-NO: 5,903,712, (hereinafter, Wang) as applied to claim 1 above, and further in view of Wang et al. US-PAT-NO: 6,647,140 B1, (hereinafter, Wang-Sharma).

Regarding, **claim 28,** Wang teaches the method of claim 9, wherein the reference copy is measured with a CCD sensor to obtain the light energy, which reads on "the received reference reflectance spectra", (col. 6, lines 5-11; col. 8, lines 59-67).

Wang does not expressly disclose, "the received reference reflectance spectra is converted into the reference parameter vector using observer functions, and illuminant spectra, and a reference reflectance spectra".

However, Wang-Sharma teaches of a scanning device (110) that detects light reflected from the surface of an image, determines the optical values from the reflected light, converts these optical values into reflectance values (i.e. reference reflectance spectra) and with a knowledge of the viewing illuminant spectrum (i.e. illuminant spectra), may further convert the image from spectral space to CIE Lab (i.e. observer functions), which reads on "wherein the received reference reflectance spectra is converted into the reference parameter vector using observer functions, and illuminant spectra, and a reference reflectance spectra", (col. 2, lines 61-63; col. 3, lines 2-5; col. 3, lines 60-65).

At the time the time the invention was made it would have been obvious to one of ordinary skill in the art to modify Wang's method of claim 9 with Wang-Sharma's method of claim 28.

One of ordinary skill in the art would have been motivated to make this modification because it allows the output device to produce a reproduction that matches the original physical image under the aforementioned viewing illuminant, (col. 3, lines 62-65).

Conclusion

11. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Gindele et al. US-PAT-NO : 6,594,388 B1, see col. 26, lines 47-62).

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Melanie M Vida whose telephone number is (703) 306-4220. The examiner can normally be reached on 8:30 am 5:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kimberly A. Williams can be reached on (703) 305-4863. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Melanie M Vida
Examiner
Art Unit 2626

MMV
mmv

July 1, 2004

~~KIMBERLY WILLIAMS~~
~~SUPERVISORY PATENT EXAMINER~~

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